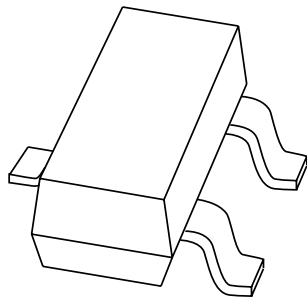


# DATA SHEET



## **PLVA600A series** Low-voltage avalanche regulator diodes

Product specification  
Supersedes data of 1996 Apr 26

1999 May 25

# Low-voltage avalanche regulator diodes

# PLVA600A series

## FEATURES

- Very low dynamic impedance at low currents: approximately  $\frac{1}{20}$  of conventional series
- Hard breakdown knee
- Low noise: approximately  $\frac{1}{10}$  of conventional series
- Total power dissipation: max. 250 mW
- Small tolerances of  $V_Z$
- Working voltage range: nom. 5.0 to 6.8 V
- Non-repetitive peak reverse power dissipation: max. 30 W.

## APPLICATIONS

- Low current, low power, low noise applications
- CMOS RAM back-up circuits
- Voltage stabilizers
- Voltage limiters
- Smoke detector relays.

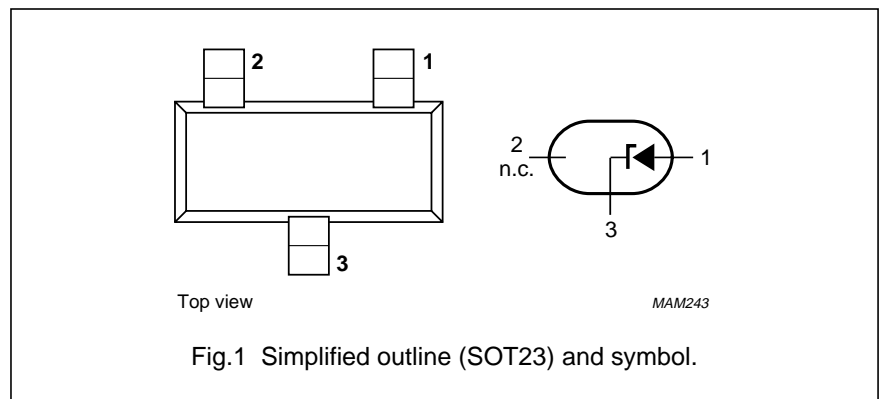
## DESCRIPTION

High performance voltage regulator diodes in small SOT23 plastic SMD packages.

The series consists of PLVA650A to PLVA668A.

## PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



## MARKING

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PLVA650A	*9A
PLVA653A	*9B
PLVA656A	*9C
PLVA659A	*9D
PLVA662A	*9E
PLVA665A	*9F
PLVA668A	*9G

## Note

1. \* = p: Made in Hong Kong.  
\* = t: Made in Malaysia.

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_F$	continuous forward current		–	250	mA
$I_{ZRM}$	repetitive peak working current	$t_p = 100 \mu s; \delta = 10\%$		250	mA
$P_{ZSM}$	non-repetitive peak reverse power dissipation	$t_p = 100 \mu s; T_j = 150 \text{ }^\circ\text{C}$		30	W
$P_{tot}$	total power dissipation	$T_{amb} = 25 \text{ }^\circ\text{C}; \text{note 1}$	–	250	mW
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$
$T_j$	junction temperature		–	150	$^\circ\text{C}$

## Note

1. Device mounted on an FR4 printed circuit-board.

## Low-voltage avalanche regulator diodes

## PLVA600A series

**ELECTRICAL CHARACTERISTICS** $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	forward voltage	$I_F = 10\text{ mA}$	–	–	0.9	V
$V_Z$	working voltage	$I_Z = 250\text{ }\mu\text{A}$				
	PLVA650A		4.80	5.00	5.20	V
	PLVA653A		5.10	5.30	5.50	V
	PLVA656A		5.40	5.60	5.80	V
	PLVA659A		5.70	5.90	6.10	V
	PLVA662A		6.00	6.20	6.40	V
	PLVA665A		6.30	6.50	6.70	V
	PLVA668A		6.60	6.80	7.00	V
$V_Z$	working voltage	$I_Z = 10\text{ }\mu\text{A}$				
	PLVA650A		–	4.30	–	V
	PLVA653A		–	5.20	–	V
	PLVA656A		–	5.51	–	V
	PLVA659A		–	5.85	–	V
	PLVA662A		–	6.19	–	V
	PLVA665A		–	6.49	–	V
	PLVA668A		–	6.80	–	V
$R_Z$	dynamic resistance	1 kHz superimposed; $I_{ZAC}$ is 10% of $I_{ZDC}$ ; $I_Z = 250\text{ }\mu\text{A}$				
	PLVA650A		–	–	700	$\Omega$
	PLVA653A		–	–	250	$\Omega$
	PLVA656A to PLVA668A		–	–	100	$\Omega$
$S_Z$	temperature coefficient	$I_Z = 250\text{ }\mu\text{A}$				
	PLVA650A		–	0.20	–	mV/K
	PLVA653A		–	1.60	–	mV/K
	PLVA656A		–	1.90	–	mV/K
	PLVA659A		–	2.40	–	mV/K
	PLVA662A		–	2.65	–	mV/K
	PLVA665A		–	2.90	–	mV/K
	PLVA668A		–	3.40	–	mV/K
$I_R$	reverse current	$V_R = 80\% V_Z$ nominal				
	PLVA650A		–	–	20000	nA
	PLVA653A		–	–	5000	nA
	PLVA656A		–	–	1000	nA
	PLVA659A		–	–	500	nA
	PLVA662A		–	–	100	nA
	PLVA665A		–	–	50	nA
	PLVA668A		–	–	10	nA

## Low-voltage avalanche regulator diodes

## PLVA600A series

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_R$	reverse current	$V_R = 50\% V_Z$ nominal				
	PLVA650A		–	34	–	nA
	PLVA653A		–	22	–	nA
	PLVA656A		–	1.1	–	nA
	PLVA659A		–	0.9	–	nA
	PLVA662A		–	0.9	–	nA
	PLVA665A		–	0.9	–	nA
	PLVA668A		–	0.8	–	nA
$I_R$	reverse current	$V_R = 90\% V_Z$ nominal				
	PLVA650A		–	21	–	$\mu$ A
	PLVA653A		–	3.5	–	$\mu$ A
	PLVA656A		–	1.3	–	$\mu$ A
	PLVA659A		–	1.0	–	$\mu$ A
	PLVA662A		–	0.05	–	$\mu$ A
	PLVA665A		–	0.04	–	$\mu$ A
	PLVA668A		–	0.006	–	$\mu$ A
$\Delta V_Z$	line regulation					
	PLVA659A to PLVA668A	$I_{LO} = 10 \mu\text{A}; I_{Hi} = 1 \text{ mA}$	–	–	0.1	V
	PLVA656A	$I_{LO} = 50 \mu\text{A}; I_{Hi} = 1 \text{ mA}$	–	–	0.1	V
	PLVA650A PLVA653A	$I_{LO} = 100 \mu\text{A}; I_{Hi} = 1 \text{ mA}$ $I_{LO} = 100 \mu\text{A}; I_{Hi} = 1 \text{ mA}$	– –	– –	0.4 0.2	V V
$V_n$	noise voltage density	$f = 1 \text{ kHz}; B = 1 \text{ kHz}; I_Z = 250 \mu\text{A}$	–	–	1.0	$\frac{\mu\text{V}}{\sqrt{\text{Hz}}}$

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	500	K/W

## Note

1. Device mounted on an FR4 printed circuit-board.

Low-voltage avalanche regulator diodes

PLVA600A series

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



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## Low-voltage avalanche regulator diodes

## PLVA600A series

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### DEFINITIONS

<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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Low-voltage avalanche regulator diodes

PLVA600A series

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